

REMARKS

Favorable reconsideration of this application is respectfully requested in view of the following remarks.

Submitted with this Amendment is a Third Information Disclosure Statement providing copies of several documents cited in an Official Action issued in a corresponding Japanese application. The Examiner is kindly asked to consider such information together with the partial English language translation of the Japanese Official Action submitted with the Information Disclosure Statement. The Examiner is also asked to consider the information contained in the Second Information Disclosure Statement filed on March 24, 2008.

This Amendment presents a new Abstract of the Disclosure and amendments to the specification to address the issues raised on pages 2-4 of the Official Action. Accordingly, withdrawal of those objections is respectfully requested.

The only independent claims currently pending in this application are Claims 3 and 6.

The claims at issue here pertain to a vehicle motion control apparatus. As set forth in Claim 3, the vehicle motion control apparatus comprises vehicle-body speed obtaining means that obtains the vehicle-body speed of the vehicle, steering-member operating amount obtaining means that obtains the operating amount of the vehicle steering member which changes the steering angle of the vehicle wheels, and actual lateral acceleration related quantity obtaining means that obtains, as an actual lateral acceleration related quantity, the actual value of the lateral acceleration related quantity indicating the extent of turning of the vehicle. A target lateral acceleration related quantity calculating means calculates a target lateral

acceleration related quantity, which is a target value of the lateral acceleration related quantity according to the vehicle-body speed, such that: i) when the vehicle-body speed is at least a prescribed value, the absolute value of the target lateral acceleration related quantity is equal to or less than the absolute value of a reference lateral acceleration related quantity which is a reference value of the lateral acceleration related quantity determined by a prescribed rule based on at least the vehicle-body speed and the steering-member operating amount; and ii) when the vehicle-body speed is less than the prescribed value, the absolute value of the target lateral acceleration related quantity is greater than or equal to the absolute value of the reference lateral acceleration related quantity. The vehicle motion control apparatus also includes braking force control means that controls the braking force applied to each of the front and rear wheels of the vehicle so that the actual lateral acceleration related quantity approaches the target lateral acceleration related quantity.

The Official Action sets forth a rejection of independent Claim 3 based on a combination of the disclosures in U.S. Patent No. 6,081,761 to Harada et al. in view of the disclosure in U.S. Patent No. 6,208,927 to Mine et al. Harada et al. discloses a vehicle deceleration control apparatus that is designed to decelerate a turning vehicle to effect an appropriate grip between the tire and the road surface depending upon the road surface conditions on which the vehicle is traveling/turning. The disclosed system includes an ECU 28 supplied with signals from a variety of sensors. The sensor signals from the sensors are used to detect the turning state of the vehicle and the driving operation performed by the driver. The sensors include wheel speed sensors 30, a longitudinal acceleration sensor 32 that detects the

longitudinal acceleration acting on the vehicle, a lateral acceleration sensor 34 that detects the lateral acceleration of the vehicle, and a yaw rate sensor 36 that detects the yaw rate associated with the vehicle. During turning of the vehicle on a high-friction road surface when the vehicle is not under yaw moment control, the system determines a safe vehicle speed within the rollover limit of the vehicle. When the vehicle is turning on a low-friction road surface under yaw moment control, the system determines a safe vehicle speed intended to ensure appropriate tire grip with the road surface according to the estimated road friction coefficient. If the system determines that the vehicle is about to exceed the safe speed during turning, the vehicle is automatically decelerated to the safe speed or a lesser speed.

The Official Action recognizes one deficiency in the Harada et al. disclosure relative to the claimed vehicle motion control apparatus cited in independent Claim 3. That is, Harada et al. does not disclose a target lateral acceleration related quantity calculating means that calculates a target lateral acceleration related quantity such that: when the vehicle-body speed is at least a prescribed value, the absolute value of the target lateral acceleration related quantity is equal to or less than the absolute value of a reference lateral acceleration related quantity (a reference value of the lateral acceleration related quantity determined by a prescribed rule based on at least the vehicle-body speed and the steering-member operating amount); and when the vehicle-body speed is less than the prescribed value, the absolute value of the target lateral acceleration related quantity is greater than or equal to the absolute value of the reference lateral acceleration related quantity.

The Official Action addresses this deficiency by referring to the disclosure in Mine et al. It is respectfully submitted that this reliance is misplaced. Mine et al.

does not actually disclose a target lateral acceleration related quantity calculating means that calculates a target lateral acceleration related quantity such that when the vehicle-body speed is at least a prescribed value, the absolute value of the target lateral acceleration related quantity is equal to or less than the absolute value of a reference lateral acceleration quantity. The reference lateral acceleration related quantity against which the absolute value of the target lateral acceleration related quantity is measured is a theoretical value of the lateral acceleration related quantity acting on the vehicle when the vehicle is turning in a state in which the steering-member operating amount and the vehicle body speed are both constant. The wording in independent Claim 3 is clarified to make more clear what is meant by the reference lateral acceleration related quantity against which the absolute value of the target lateral acceleration related quantity is measured.

The bottom portion of column 14 of Mine et al. describes a reference value setting section 26a that calculates a reference value $ayl1n$ of an allowable lateral acceleration $ayln$ according to the friction coefficient of the road surface. A vehicle speed correction section 26b then corrects the reference value $ayl1n$ to a corrected value $ayl2n$ according to the vehicle speed. The reference value $ayl1n$ in Mine et al. is not a theoretical value of the lateral acceleration acting on the vehicle when the vehicle is turning in a state in which the steering-member operating amount and the vehicle-body speed are both constant.

In addition, as the Official Action correctly notes, Mine et al. also lacks disclosure that a target lateral acceleration related quantity calculating means calculates a target lateral acceleration related quantity such that when the vehicle-body speed is less than a prescribed value, the absolute value of the target lateral

acceleration related quantity is greater than or equal to the absolute value of the reference lateral acceleration related quantity. The Official Action comments that allowable lateral acceleration will necessarily increase at lower vehicle speeds. This comment is based on the discussion at the top of column 15 describing enhancing the driving safety at high speeds by correcting the allowable lateral acceleration to be reduced while the vehicle speed increases. However, this comment at the top of column 15 of Mine et al. does not describe calculating a target lateral acceleration related quantity as recited in Claim 3.

That is, Claim 3 does not recite that allowable lateral acceleration increases at lower speeds. Rather, Claim 3 defines the target lateral acceleration related quantity calculating means that calculates a target lateral acceleration related quantity such that when the vehicle-body speed is at least a prescribed value, the absolute value of the target lateral acceleration related quantity is equal to or less than the absolute value of a reference lateral acceleration related quantity (which is a reference value of the lateral acceleration related quantity determined by a prescribed rule based on at least the vehicle-body speed and the steering-member operating amount), and when the vehicle-body speed is less than the prescribed value, the absolute value of the target lateral acceleration related quantity is greater than or equal to the absolute value of the reference lateral acceleration related quantity. This is lacking in Mine et al. as well as Harada et al.

For at least the reasons set forth above, the vehicle motion control apparatus recited in Claim 3 is allowable over the combination of the cited references.

The vehicle motion control apparatus recited in independent Claim 6 comprises vehicle-body speed obtaining means that obtains a vehicle-body speed of

the vehicle, steering-member operating amount obtaining means that obtains the operating amount of the vehicle steering member, and an actual lateral acceleration related quantity obtaining means that obtains, as the actual lateral acceleration related quantity, the actual value of a lateral acceleration related quantity indicating the extent of turning of the vehicle. In addition, a target lateral acceleration related quantity calculating means calculates a target lateral acceleration related quantity, which is a target value of the lateral acceleration related quantity, such that the absolute value of the target lateral acceleration related quantity is equal to or less than the absolute value of a reference lateral acceleration related quantity which is a reference value of the lateral acceleration related quantity determined by a prescribed rule based on at least the vehicle-body speed and the steering-member operating amount. A braking force control means controls the braking force applied to each of the front and rear wheels of the vehicle so that the actual lateral acceleration related quantity approaches the target lateral acceleration related quantity.

To better define what is intended by the claimed reference to the target lateral acceleration related quantity calculating means, Claim 6 is amended to recite the subject matter recited in Claim 8. Claim 6 thus now defines that the target lateral acceleration related quantity calculating means calculates the target lateral acceleration related quantity such that the absolute value of the target lateral acceleration related quantity does not exceed a target lateral acceleration related quantity limiting value, wherein such target lateral acceleration related quantity limiting value is set in accordance with an actual specification value of the vehicle which influences the generated roll angle of the vehicle.

To provide an explanation or example, while noting that Claim 6 is not limited in this regard, the present application describes an embodiment in which an actual specification value of the vehicle which influences the generated roll angle of the vehicle corresponds to the ratio of the centroid height H to the wheel tread T . In addition, as discussed beginning on page 47 of the application, the target lateral acceleration related quantity limiting value corresponds to $G_{y\text{limit}} (H/T)$. Fig. 9 illustrates that the absolute value of the target lateral acceleration G_y is designed so as not to exceed the target lateral acceleration related quantity limiting value.

Mine et al. does not disclose providing a target lateral acceleration related quantity calculating means that calculates the target lateral acceleration related quantity such that the absolute value of the target lateral acceleration related quantity does not exceed a target lateral acceleration related quantity limiting value, wherein such target lateral acceleration related quantity limiting value is set in accordance with an actual specification value of the vehicle which influences the generated roll angle of the vehicle.

It is thus respectfully submitted that independent Claim 6 is also allowable.

The dependent claims are allowable at least by virtue of their dependence from allowable independent claims. Thus, a detailed discussion of the additional distinguishing aspects of the vehicle motion control apparatus recited in the dependent claims is not set forth at this time.


Early and favorable action with respect to this application is respectfully requested.

Should any questions arise in connection with this application or should the Examiner believe that a telephone conference with the undersigned would be helpful in resolving any remaining issues pertaining to this application the undersigned respectfully requests that he be contacted at the number indicated below.

Respectfully submitted,

BUCHANAN INGERSOLL & ROONEY PC

Date: June 23, 2008

By: 
Matthew L. Schneider
Registration No. 32814

P.O. Box 1404
Alexandria, VA 22313-1404
703 836 6620